

We claim:

1. A method implemented by a wireless network for a TCP (transmission control protocol) connection between a transmitting host and a wireless receiving host served by the wireless network, the method comprising:

the wireless network determining when the wireless receiving host is in handoff;

the wireless network determining when the wireless receiving host is no longer in handoff;

- 10 the wireless network notifying the transmitting host when the wireless receiving host is in handoff and when the wireless receiving host is no longer in handoff.

2. A method according to claim 1 wherein a physical layer protocol determines when the wireless receiving host is in handoff and when the wireless receiving host is no longer in handoff.

3. A method according to claim 1 further comprising:

the wireless network receiving packets over the TCP connection from the transmitting host;

- 20 while the wireless receiving host is in handoff, the wireless network buffering the packets received over the TCP connection;

- after the wireless receiving host is no longer in handoff, the wireless network transmitting the buffered packets to the wireless receiving host.

4. A method according to claim 1 wherein the wireless network notifying the transmitting host when the wireless receiving host is in handoff and when the wireless receiving host is no longer in handoff is done using acknowledgement packets.

5. A method according to claim 4 wherein the wireless network notifying the transmitting host when the wireless receiving host is in handoff and when the wireless receiving host is no longer in handoff using acknowledgement packets comprises:

the wireless network receiving acknowledgement packets from the wireless receiving host in respect of the TCP connection;

the wireless network including an indication in at least one acknowledgement packet of whether the wireless receiving host is in handoff or no longer in handoff;

the wireless network transmitting the acknowledgements packets to the transmitting host.

6. A method according to claim 4 wherein the wireless network notifying the transmitting host when the wireless receiving host is in handoff and when the wireless receiving host is no longer in handoff using acknowledgement packets comprises:

the wireless network receiving acknowledgement packets from the wireless receiving host in respect of the TCP connection;

the wireless network maintaining a local copy of a last received acknowledgement packet;

the wireless network including an indication in at least one acknowledgement packet of whether the wireless receiving host is in handoff;

the wireless network transmitting the  
5 . acknowledgements packets, to the transmitting host;

immediately after determining that the wireless receiving host is no longer in handoff, transmitting the local copy of the last received acknowledgement packet, the local copy indicating the wireless receiving host is no longer in  
10 handoff.

7. A method according to claim 4 wherein the wireless network notifying the transmitting host when the wireless receiving host is in handoff and when the wireless receiving host is no longer in handoff using acknowledgement packets  
15 comprises:

the wireless network receiving acknowledgement packets from the wireless receiving host in respect of the TCP connection;

the wireless network maintaining a local copy of a  
20 last received acknowledgement packet;

immediately after determining that the wireless receiving host is in handoff, transmitting the local copy of the last received acknowledgement packet, the local copy indicating the wireless receiving host is in handoff;

25 the wireless network transmitting the acknowledgements packets to the transmitting host;

immediately after determining that the wireless receiving host is no longer in handoff, transmitting the local

copy of the last received acknowledgement packet, the local copy indicating the wireless receiving host is no longer in handoff.

8. A method according to claim 5 wherein each

5 acknowledgement packet includes an indication of whether the wireless receiving host is in handoff or no longer in handoff.

9. A method according to claim 5 wherein notifying the transmitting host when the wireless receiving host is in handoff and when the wireless receiving host is no longer in

10 handoff using acknowledgement packets is done using a TCP flag in the acknowledgement packets.

10. A method according to claim 5 wherein notifying the transmitting host when the wireless receiving host is in handoff and when the wireless receiving host is no longer in

15 handoff using acknowledgement packets is done using a TCP option in the acknowledgement packets.

11. A method according to claim 1 wherein the wireless network notifying the transmitting host when the wireless receiving host is in handoff and when the wireless receiving

20 host is no longer in handoff is done using ICMP (Internet control message control) messages.

12. A wireless network adapted to implement a method according to claim 1.

13. A wireless network node adapted to implement a method  
25 according to claim 1.

14. A method implemented by a transmitting host for a TCP connection between the transmitting host and a wireless receiving host served by a wireless network, the method comprising:

the transmitting host receiving notifications of when the wireless receiving host is in handoff and when the wireless receiving host is no longer in handoff;

the transmitting host behaving in a first manner  
5 while the wireless receiving host is not in handoff;

the transmitting host behaving in a second manner while the wireless receiving host is in handoff.

15. A method according to claim 14 wherein the transmitting TCP host behaving in a first manner while the  
10 wireless receiving host is not in handoff comprises behaving in accordance with conventional TCP.

16. A method according to claim 14 wherein the transmitting TCP host behaving in a second manner while the wireless receiving host is in handoff comprises:

15 suspending transmission of packets on the TCP connection;

ignoring timeouts due to packets which have been transmitted for which no acknowledgements have been received.

17. A method according to claim 14 wherein the  
20 transmitting TCP host behaving in a second manner while the wireless receiving host is in handoff comprises:

suspending transmission of packets on the TCP connection;

ignoring timeouts due to packets which have been  
25 transmitted for which no acknowledgements have been received;

freezing a TCP congestion window.

18. A method according to claim 14 further comprising  
upon first receiving an indication that the wireless receiving  
host is not in handoff after previously having received an  
indication that the wireless receiving host is in handoff the  
5 transmitting host resuming behaving in the first manner from a  
previous transmission context beginning with a packet following  
a last acknowledged packet.

19. A method according to claim 17 further comprising  
upon first receiving an indication that the wireless receiving  
10 host is not in handoff after previously having received an  
indication that the wireless receiving host is in handoff the  
transmitting host resuming behaving in the first manner from a  
previous transmission context beginning with a packet following  
a last acknowledged packet.

20. A method according to claim 16 wherein the  
transmitting TCP host behaving in a second manner while the  
wireless receiving host is in handoff further comprises  
suppressing fast retransmit.

21. A transmitting host adapted to implement method  
20 according to claim 12.

22. A TCP protocol stack adapted to implement a method  
according to claim 12.

23. An apparatus adapted to be an intermediary in a TCP  
connection between a transmitting host and a wireless receiving  
25 host, the apparatus comprising:

means for determining when the wireless receiving  
host is in handoff;

means for notifying the transmitting host when the  
wireless receiving host is in handoff and when the wireless  
5 receiving host is no longer in handoff.